2023-04-12

ABB Ability AssetInsight™

Future of operations and maintenance strategies

Welcome to ABB Ability AssetInsight™ Webinar

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By default, **all participants are muted** during the webinar

Please **submit your questions** via the chat window

If we do not have time to answer your question during the webinar, we will **respond by email**

Duration of this webinar will be about 1 hour

Presenter and Moderator

Marco Heese

Global Product Manager, ABB Smart Sensors & ABB AssetInsight™, ABB

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Senior Solution Architect, Hub Asia, ABB

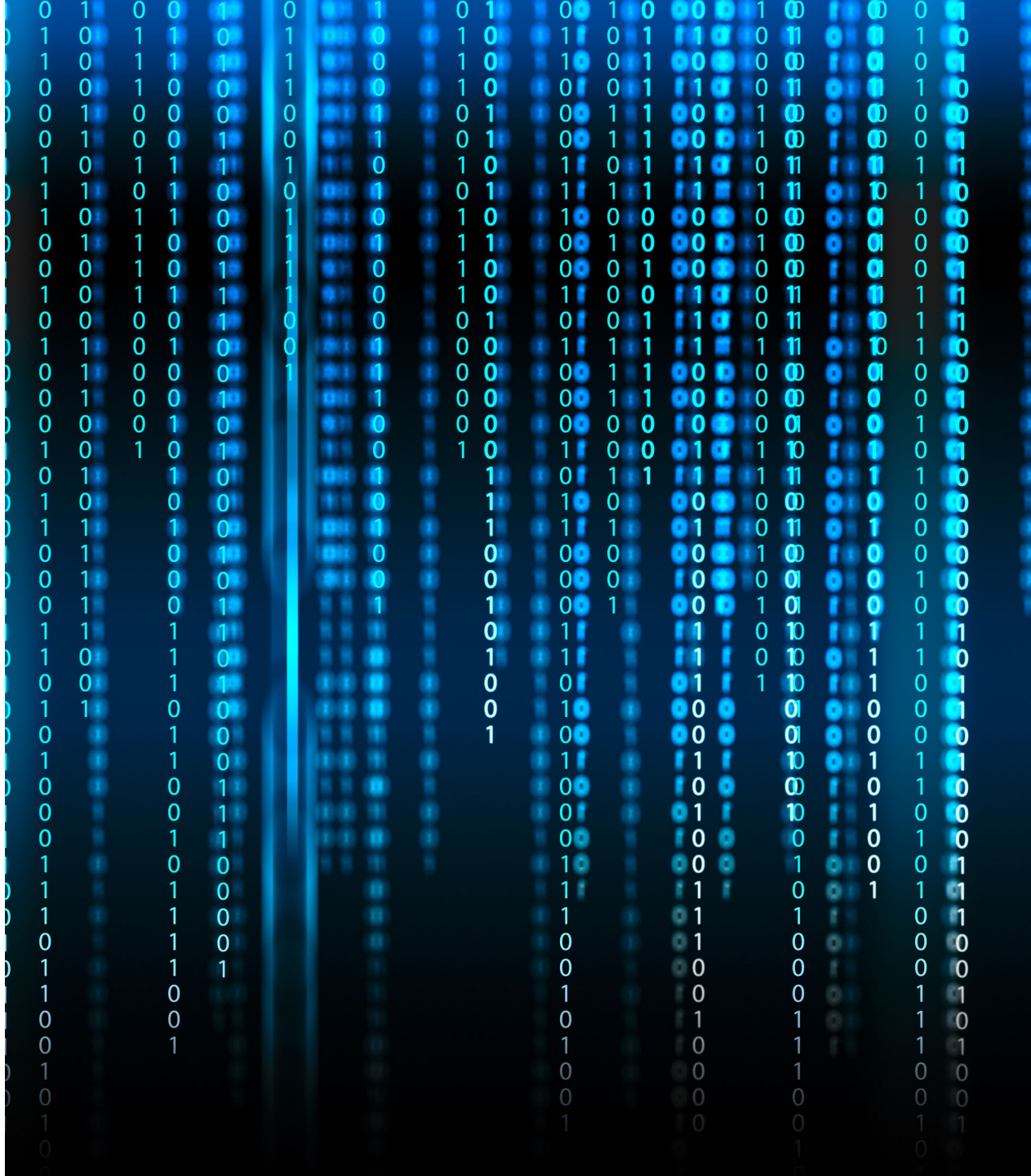
What we‘re talking about today

- Introduction to overall trends in the process industry
- major challenges & problems
- Impact to your business
- Why change now?
- ABB Asset Performance Management solutions
- Case studies
- Next steps

Overall trends in the process industry

Big Data & Industry 4.0

- Phase 1
  – structured data warehousing professionalization (1970‘s)
- Phase 2
  – web based unstructured data concentration (early 2000‘s)
- Phase 3
  – Mobile & Sensor based data generation (~2010 till today)
- Industrial Data Analytics / Industry 4.0
- Digital Twin for Predictive Maintenance



https://www.bigdataframework.org/knowledge/a-short-history-of-big-data/

Internet of Things & Digital Twin

ABB Smart Sensor example

- Collect accurate and readily accessible data in short intervals
- Monitor & assess the physical asset health condition
- Dramatically declining sensor costs
- multisensor approach

  (not just vibration)

Digital Transformation & Predictive Maintenance

- identify possible failures before it becomes a breakdown
- receive an alert on the equipment to react in time
- Digitize the operation and maintenance process
- Transition from reactive & periodic maintenance to condition-based & predictive maintenance

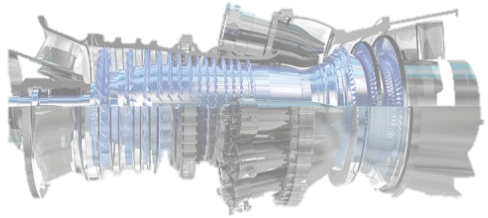
https://new.abb.com/process-automation/genix/six-steps-to-predictive-maintenance

Rotating Machinery Market undergoing digital transformation

paradigm change towards autonomy & efficiency

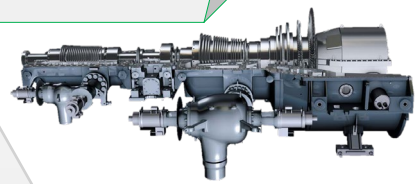
Today | Transformation | Tomorrow

Large equipment
(e.g. Turbines, generators)



Online monitoring (wired)

Online monitoring (wired)



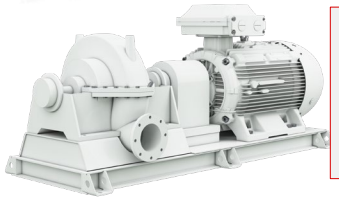
100 % automated monitoring (autonomous analytics)

90 % manual monitoring with handhelt

High impact
(high criticality)

Medium Impact
(intermediate criticality)

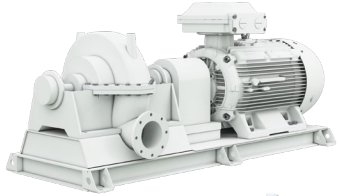
Low Impact
(less critical)



Offline inspection (handhelt)

Online monitoring (wireless)

Wireless Smart Sensors of all kind on rotating equipment



Challenges & Problems

Challenges in the digital transformation

- missing clarity / digitalization strategy
- identify data sources / missing instrumentation
- increasingly complex & interconnected, very large information networks IT/OT/ET
- Where to store the data?
  Data governance? *Cloud vs. Edge/On-Premise*
- costly (manual) data processing
  data cleaning, enhance data quality
- how to extract value from all that information?
- still using reactive and preventative maintenance

https://new.abb.com/process-automation/genix/six-steps-to-predictive-maintenance

Operational challenges and pain points

Plant managers and maintenance managers…

- unplanned downtime cost of production loss („firefighting“)
- High repair costs (Material, mounting, labour, etc.)
- High cost manual on-site inspections

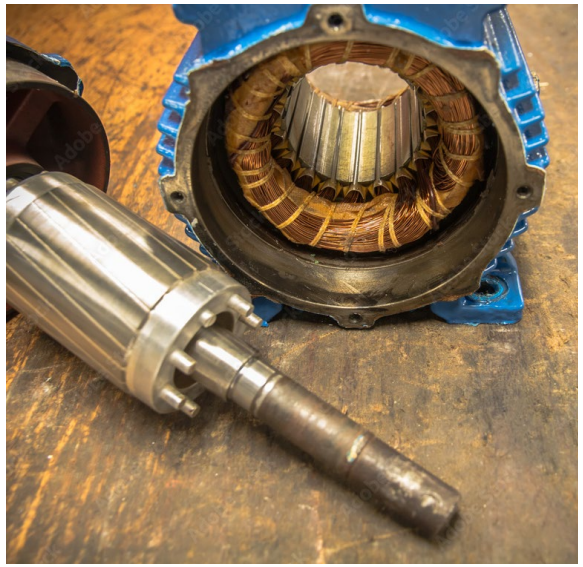
- Demographic change lack of expert knowledge on site
- No transparency on bad actors, hence no baseline to spend maintenance where really needed
  - Predict the maintenance need
- Data privacy concerns against 3rd party vendor cloud

Business Impacts

Why should you care?

What are the benefits to your business?

avoiding total repair / minimize partial repair costs



20k to 160k

USD

Average estimated costs for reinvestment after total damage depending on the machinery size

1k to 10k

USD

Average estimated costs for major repairs depending on the machinery size

?k / hour

USD

what is the average cost per hour for a partial production loss or a total production stop in your plant?

(*) even at redundant setups?

(*) in many plants the redundant backup asset is also in operation like the primary asset due do the fact that overall plant production targets have increased over years since its initial dimensioning of the plant

Why change now?

Why change now?

- Add a few days of production to the year.

  When deployed plant wide, expect a 20% improvement in reliability.

- Avoid unplanned downtime.

  Get good at firefighting

- Catch the small problem before it becomes the multi-million dollar one.

  This is cheaper and usually faster to fix.

- Safety

  a more reliable plant is a safer plant.

- Environmental

  avoid unnecessary flaring, startup/shutdown, leaks

- Less Cost, More Revenue = Higher Profitability

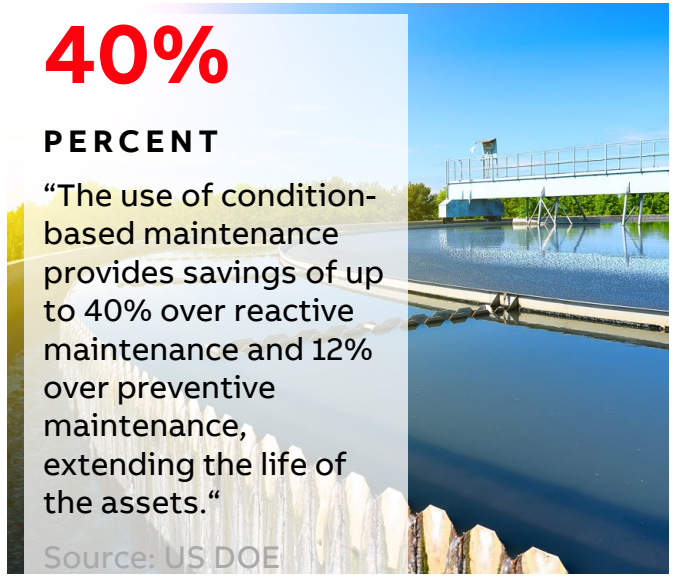


ABB Asset Performance Management solutions

Video: Tom’s story

For those of you watching the recording – please use https://youtu.be/JsaEdWsocKA

Standard size rotating equipment

ABB Smart Sensors & ABB Ability AssetInsight™ to enable digital service for unmonitored equipment

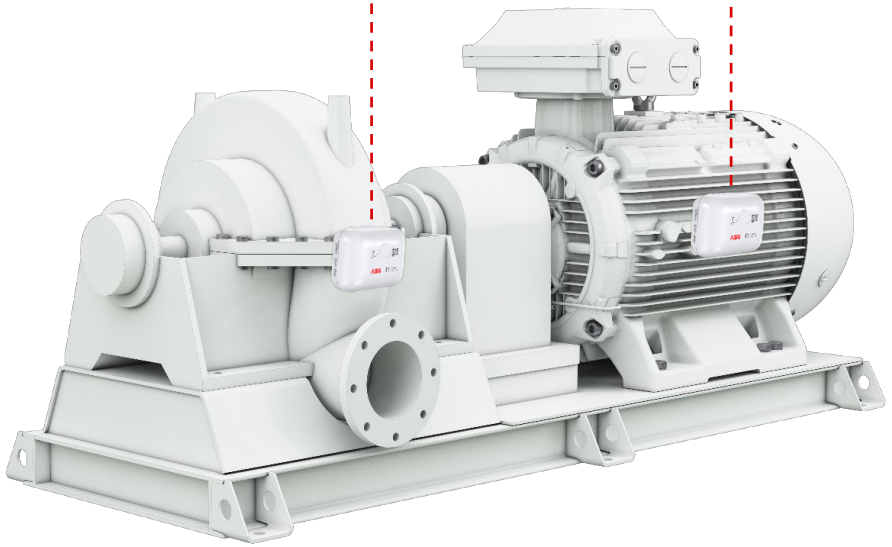


ABB Ability AssetInsight™

- Failure Mode KPI‘s
- Failure Forecast KPI‘s
- Expert Analysis Workbench spectra / waveforms
- Email Notification
- Data connectivity API‘s
- ABB Care Services

Optional: data extraction to 3rd party systems in IT/OT domain is available via e.g. OPC UA, REST-API or file export, MQTT etc.

ABB Care - Condition Monitoring for Rotating Machines

ABB Wireless Sensors for Low Cost Condition Monitoring

ABB Next Generation Smart Sensor

- Vibrations (3 axis), temperature, magnetic field and ultrasonic acoustics (0,1-80kHz)
- one vibration sensor measures three directions with 10 – 1000 Hz;
- the second sensor measures radial vibration up to 20,000 Hz.
- measurement range up to 50G (high frequency z-axis)
- lifetime of the battery is up to 15 years, depending on usage, temperature and settings.
- Flexible firmware can be easily adapted to new requirements
- certified for ATEX, IECEx zone 0/20 and Class 1, Division 1, Class 2, Division 1
- sensor can operate between -40 to +85 °C
- Bluetooth 5 or WirelessHART communication
- Next Generation Smart Sensor can be used for ABB motors as well as motors from other manufacturers and all other rotating equipment
- attached to the asset's frame with an aluminum clamping bracket or stainless-steel mounts for gluing are also available
- Applicable for standard size motors, pumps, fans, compressors and other rotating equipment

See: https://new.abb.com/motors-generators/service/advanced-services/smart-sensor

ABB Ability AssetInsight™

Enterprise Asset Fleet Wide Analytics Overview

Fleetwide overview dashboards with History

Easy drill-down to detailed analytics per asset

Navigate from multi-site overview down to equipment level

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Use Cases

Enterprise wide remote monitoring

- Aggregated data on global level for reliability engineers
- No need for site visits and manual measurements for the rotating asset fleet anymore

Plant specific health status of asset fleet

- Actual aggregated data on plant level for the asset manager/maintenane manager
- Filtering and sorting of the indicated bad actors drill down capability

Asset specific failure mode analysis

- Automatically calculated Failure Modes KPI‘s (e.g. imbalance, bearing faults, cavitation etc.) for proactive maintenance decision
- No expert knowledge needed anymore to understand failures from the raw data

Gain full transparency on the asset health status for improving reliability and reduce maintenance costs

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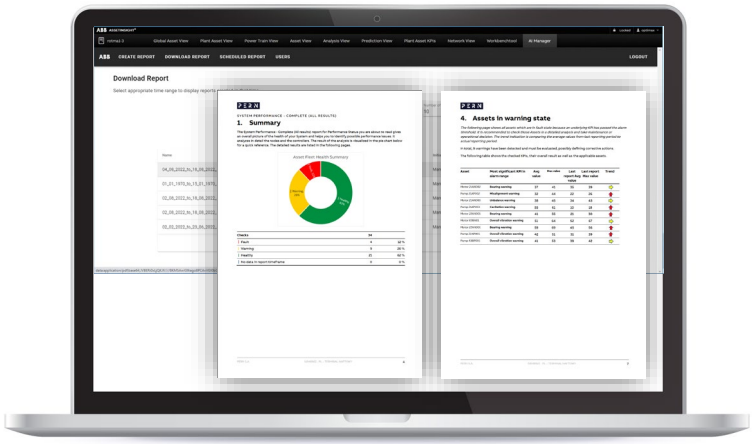
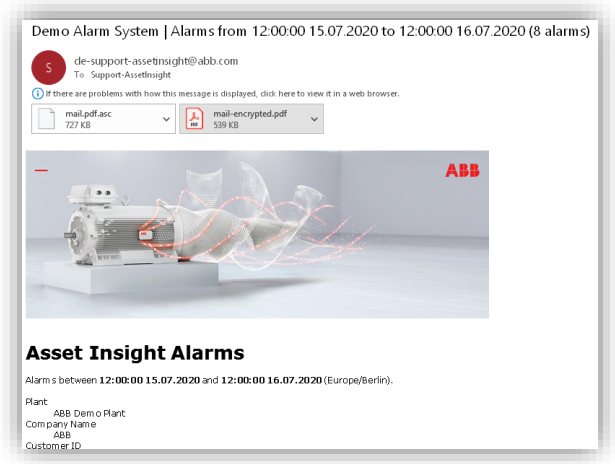
Use Cases



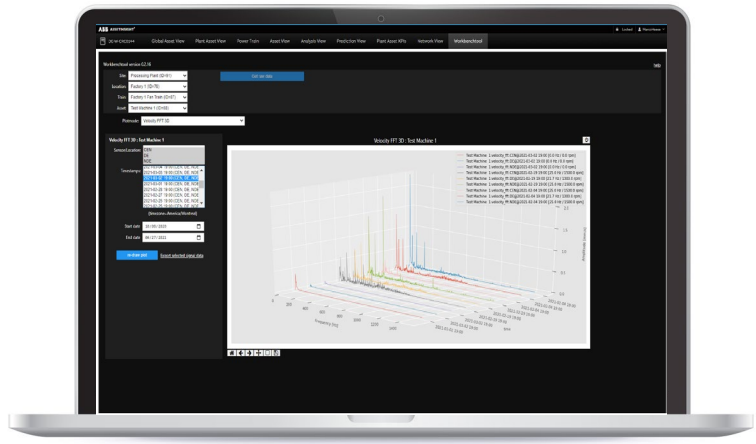
Automatic & on-demand reporting

- Generate periodic asset fleet reports
- Download on-demand asset specific reports (* available with AI version 2.0)



E-Mail Notification

- Send summary report by mail
- Receive ad-hoc alerts from configured alarm profile



Raw Data Analysis Workbench for experts

- Plot the vibration trends and overlay with reference measurements
- Analyse waveforms and spectre
- Export data to e.g. Excel

Automate the analysis process to save money and time for decision making

Case studies

Case study examples

Major oil & gas corporation in India

- Uninstrumented rotating assets now equipped with ABB Smart Sensors
- ABB AssetInsight enabling remote monitoring from headquarter
- Failure mode detection & forecasting to support the maintenance teams becoming proactive

Gas Liquefaction plant US Florida

- ABB Smart Sensors monitoring LV motors, high pressure centrifugal pumps etc.
- Remote asset monitoring capability and asset health reports
- ABB enabling condition-based and predictive maintenance
- Scaling across multiple sites

Energy provider Singapore

- Asset health monitoring in power plant on motors, fans and pumps
- Automatic and continuous data collection eliminates the need for manual site visits
- Enabling condition based maintenance

Biogas Refinery Norway

- Continous equipment monitoring in hazardous areas
- ABB Smart Sensors make motors, pumps and fans
- Integration of condition monitoring data from ABB AssetInsight into control system planned

ABB Asset Performance Management Solutions could be used in various applications

Case studies

- **Six steps to predictive maintenance**
  https://new.abb.com/process-automation/genix/six-steps-to-predictive-maintenance

- **Asset Insight - Use Case video**
  https://youtu.be/JsaEdWsocKA

Next steps

Next Steps

- Contact your ABB sales representative
- Discuss your pain points and use case
- Request for a demo
- Run a small scale proof of value project with ABB in a part of your plant
- Scale the benefits across your full plant and enterprise

Q&A


ABB